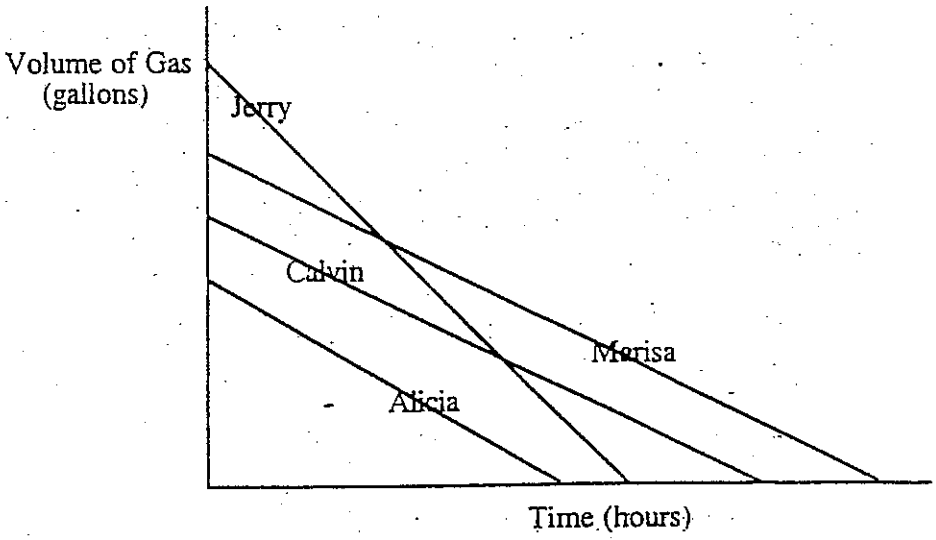
Four Cars Problem

Jerry, Alicia, Calvin, and Marisa wanted to test their cars' gas mileage. After filling their cars with gas, they drove them on a test track at 65 miles per hour until they each ran out of gas. The graphs given below show how the amount of gas in their cars changed over time.



Answer each question below and explain how you used the graphs to decide your answer.

A. Whose car had the largest gas tank?
B. Whose car ran out of gas first?
C. Whose car went the farthest?
D. Whose car gets the worst gas mileage?
E. How would the equation for Calvin's graph compare to the equation for Marisa's graph?

2

Reception Cost Problem

The high school senior class planned a graduation reception for parents and friends at a local restaurant. They held fund-raisers during their 12th grade year to raise the money. The restaurant charges $150 for the room and $10 per person for food and drinks.

A. Write an equation for the cost of the event in terms of the number of people attending. Explain how your equation matches the information the students received from the restaurant.

B. If the class has $1,620 to spend, how many people could come to the reception? Describe at least <u>two</u> methods you could use to answer this question.

C. A second restaurant told the students they charge groups according to the following equation:
$C = 25N$ C = cost and N = number of people attending.
Explain what this equation means in this context.

D. Which restaurant should the class choose if they want to keep their costs as low as possible? Explain your reasoning.

E. Is it possible that a third restaurant could charge the students according to the following equation,
$C = -150 + 15N$? Explain why or why not.

3

Phone Plans Problem

Hmwk

Your phone company offers three different monthly billing options for local phone service.

Option I: $10.00 for up to 30 calls, plus $0.20 for each additional call.

Option II: $30.00 for an unlimited number of calls.

Option III: $18.00 for up to 60 calls, plus $0.05 for each additional call.

A. If Kelly makes about 23 local calls each month, what would be the best option for him? Explain your thinking.

B. If Tamika makes about 100 local calls each month, which would be the best option for her? Explain your thinking.

C. Suppose you want to help other people decide which is the best option for them. Make a table, a graph, or write a set of the equations for Options I–III. Explain how you would use your table, graph, or equations to select the best option for different people.

4

The Contractor Problem

Thomas is a flooring contractor. He sets floor tile in people's homes. As a contractor, he has to submit a "bid" for each new job. Each time he bids on a job, he measures the area of the floor that he will tile and then figures out how much material he will need. Here are the prices for the materials that he uses regularly.

Sub-Flooring:	$1.12 per square foot
	(Sub-flooring is the wood that he lays down under the tile.)
Tile:	$4.29 per square foot
Adhesive:	$21.59 for one bucket (enough for a typical home)
Grout:	$34.95 for one bag (enough for a typical home)
Labor:	$125 plus $0.68 per square foot

A. Thomas wants a formula to help him compute the total cost of his materials and labor for a typical home. Write a formula for Thomas' total cost. Explain what the numbers and symbols in your formula mean.

B. Write a formula that simplifies Thomas' cost calculations. Explain how your formula simplifies his calculations.

C. Suppose Thomas wants to make a 15% profit on each job. (In other words, he wants to charge each customer an additional 15% of the total costs to make a profit.) Write a formula that Thomas could use to compute how much he charges his customers, including his profit.

5

Pop Machine Problem

Lincoln High School has a pop machine near their athletic fields. It automatically counts how many cans of pop people buy. One Saturday in May, Lincoln has a Field Day and students, parents, and teachers participate in sports activities. The table below shows how many cans of pop people bought between 8 A.M. to 11:30 A.M. on Field Day.

Time	*from 8–8:30 A.M.*	*from 8:30–9 A.M.*	*from 9–9:30 A.M.*	*from 9:30–10 A.M.*	*from 10–10:30 A.M.*	*from 10:30–11 A.M.*	*from 11–11:30 A.M.*	*from 11:30–12 Noon*	*from 12 Noon–12:30 P.M.*	*from 12:30–1 P.M.*
Cans of Pop	4	9	13	18	24	28	34			

A. Graph the data carefully on the attached grid paper. Allow enough room to graph data from 11:30–1:00 P.M.

B. Draw a line of best fit to the data. Find the equation of that line. Explain how you used your graph to find the equation.

C. Use your model to predict how many cans would be bought between 11:30 and 12 Noon.

D. If you received additional data that 44 cans were bought from 11:30 to 12 Noon, 58 cans from 12 Noon to 12:30 P.M., and 76 cans from 12:30 to 1:00 P.M., would you change your model? Why? If you think change is necessary, explain how you would change your model.